

Amendments to the Specification:

Please replace the paragraph beginning on page 10, line 4 with the following amended paragraph:

As shown in FIG. 4, a RX (receiving unit) frame counter and a TX (transmitting unit) frame counter in the PON slave chip have a frame count value for counting frame itself from 0 to 3 cyclically in addition to a slot counter and a byte counter. A RX frame synch pulse is generated at every other frame and a TX frame synch pulse for starting TX frame counting is generated by delaying the RX frame synch pulse by programmable amount.

Please replace the paragraph beginning on page 11, line 12 with the following amended paragraph:

And also, a state machine is ~~includes~~ included and operated as defined in the recommendation G.983.1, which transits at every event and manages operation of the whole PON slave chip. For example, data cell transmitting is executed only at operation state O8 and serial number ONU message loading in the PLOAM cell and transmitting the PLOAM cell is executed when the PLOAM grant is received at a state O7. Most of events relate to synch state change and message receiving.

Please replace the paragraph beginning on page 12, line 10 with the following amended paragraph:

The receiving unit 51 includes a cell and byte delineating unit 501 for receiving byte stream from an external serial/parallel transformer and delineating the cell and the byte, a descrambler 502 for receiving scrambled cell stream from the cell and byte delineating unit 501 and descrambling data by synchronizing internal pseudo random binary sequence to the received data, BIP (Bit Interleaved Parity) comparing unit 503 for computing a BIP value for the data received from the descrambler 502 for a period instructed by a frame synchronizing unit and comparing it with the received BIP value, the frame synchronizing unit 504 for synchronizing the frame by finding a location of the PLOAM cell and a frame starting point for the data received from the descrambler 502, a receiving demultiplexing unit 505 for demultiplexing the ATM cell and the message of the PLOAM cell and the received grant value from the data transferred from the frame synchronizing unit 504, a header error inspecting unit

506 for inspecting header error for the ATM cell transferred from the receiving demultiplexing unit 505 to correct the error or abandon the cell, a look-up processing unit 507 for reading the table depending on a VPI (Virtual Path Identifier) to check whether it is to be received or dechurned, a dechurning unit 508 for receiving ATM related information from the look-up processing unit 507 and, if necessary, dechurning the payload of the received ATM cell and changing a churning key, a receiving UTOPIA interfacing unit 509 for storing the ATM cell transferred from the dechurning unit 508 and transferring the stored ATM cell in response to an external request, a grant decoding unit 510 for decoding the grant value received from the receiving demultiplexing unit 505, a grant table 511 for receiving and storing the decoded grant values according to the writing signal from the grant decoding unit 510, a memory arbitrating and interfacing unit 512 for arbitrating connection table reading and writing requests from the message receiving processing unit ~~544~~ 542 for processing the received message and a CPU (Central Processing Unit) interface ~~550~~ 551 to process reading and writing, and a dual-port memory 513 being a memory having internal 4 K entries for storing information for VPI receiving and dechurning by using 12-bit VPI address.

Please replace the paragraph beginning on page 13, line 23 with the following amended paragraph:

The transmitting unit 52 includes a transmitting UTOPIA interfacing unit 521 for storing the ATM cell depending on an external request and transferring the ATM cell depending on a request of a transmitting multiplexing unit 523, a mini-cell generating unit 522 for generating payload of the mini-cell by using buffer information of the transmitting UTOPIA interfacing unit 521 or data from the external interface, the transmitting multiplexing unit 523 for determining category of the cell transferred via a grant table of the receiving unit ~~50~~ 51 by the frame count and the slot counter of internal, transmitting an enable signal to a transmitting message processing unit ~~544~~ 543, the mini-cell generating unit 522 or the transmitting UTOPIA interfacing unit 521, and generating slot data including transmitting overhead by multiplexing resultant data, a BIP inserting unit 524 for computing a BIP value for all data except for the overhead and the mini-cell for data transferred from the transmitting multiplexing unit 523 as instructed by the transmitting multiplexing unit 523 and inserting the BIP value into last byte of the PLOAM cell, a scrambler 525 for scrambling all data except for the overhead as instructed by the transmitting multiplexing unit 523 or the BIP inserting unit 524, a bit delayer 526 for selectively delaying the

transmitted data transferred through the scrambler 525, and a ranging counter 527 for counting pulses from the frame synchronizing unit 504 by the delay T_d from the received message by delaying the pulses.

Please replace the paragraph beginning on page 16, line 18 with the following amended paragraph:

Firstly, it will be described for operation of the receiving unit ~~50~~ 51. After the cell and byte delineating unit 501 divides data inputted from external into possible byte streams, it performs cell delineation for each stream and declares found cell delineation among them as a correct byte delineation. Also, the cell and byte delineating unit 501 has one of "HUNT", "PRESYNC" and "SYNC" states for each byte stream and the most significant 2 bits of a HEC (Header Error Correction) are excepted untill the receiving descrambler 502 is synchronized.

Please replace the paragraph beginning on page 18, line 13 with the following amended paragraph:

The grant decoding unit 510 decodes the received grant value and writes it at the receiving grant table 511 to let the transmitting unit ~~50~~ 52 use it.

Please replace the paragraph beginning on page 18, line 24 with the following amended paragraph:

The dual-port memory 513 is a memory that has 4 K internal entries and stores, by using the 12-bit VPI value as an address, information for whether or not each of the VPIs is received and whether or not the payload is dechurned. Not only the look-up processing unit ~~407~~ 507 reads/writes the memory but also the receiving message processing unit 542 writes the memory (when receiving the churned VP message). Furthermore, since the CPU interfacing unit 551 accesses this memory, the memory arbitrating and interfacing unit 512 arbitrates memory read and write requests.

Please replace the paragraph beginning on page 20, line 24 with the following amended paragraph:

For example, for the data cell, the overhead and the ATM cell transferred from the transmitting UTOPIA interfacing unit 521 are selected subsequently to generate the slot data. For the PLOAM cell, the overhead, the PLOAM cell header, IDENT (it is named by ITU-T in that the value is identical for all cells) pattern, a message from the transmitting message processing unit ~~30~~ 543, a LCF (Laser Control Field), and a RXCF (Receiver Control Field) are selected subsequently to generate the slot data.

Please replace the paragraph beginning on page 22, line 20 with the following amended paragraph:

Receiving the enable signal from the transmitting multiplexing unit 523, the transmitting message processing unit 543 determines the message to be transferred based on a message generating request signal asserted at that time. The CRC value is generated within the transmitting multiplexing unit 523. About 10 messages are transferred in upstream for ranging, OMA OAM, churning and message acknowledge.

Please replace the paragraph beginning on page 22, line 27 with the following amended paragraph:

The message transmitting request signal waiting at the transmitting message processing unit 543 is serviced in priority and there is a counter, for the message to be transferred a number of times, decreased ~~###~~ until final transfer. For equal priority, cyclic service is established.